

## Abstract

### **Insulating Packaging Material and Related Packaging System**

Insulating packaging material is wrapped or otherwise positioned around the typically temperature sensitive product, with the packing material including, alternatively, 1 ply (**Fig. 22**; metallized plastic film), 2 ply (**Figs. 23 & 24**) and 3 ply (**Fig. 25**) material, in which some of the 2 ply & 3 ply embodiments include a layer of bubble wrap material having its bubble side placed or laminated against the flat side of the adjacent ply, which adjacent ply can be, for example, a metallized plastic film or a foam layer or both layers can be included. With such a bubble side arrangement, multitudinous air pockets are formed between the bubbles of the bubble wrap and the other ply's typically flat interfacing surface. A separate layer of bubble wrap also preferably is placed about the interior of the box with its bubble side placed against the interior flat surfaces of the box, with the bubbles forming air pockets with the flat sides, further enhancing the insulating properties of the packaging for the goods. An exemplary system for delivering perishable groceries (**120/120'**), including a corrugated cardboard or other type box (**100**); a source of cold (or heat as needed) maintaining the temperature inside the box within a desired temperature range for hours or days, using an all encompassing pouch of packet material (**110/10**), used individually (**Figs. 2 & 3**) or collectively (**Figs. 5 & 6**), with each packet (**17**)

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containing a super-absorbent polymer (14, Fig. 12) which is hydrated (14', Fig. 12A) and then either frozen (*e.g.*, in a freezer) or heated (*e.g.*, in a microwave), without producing moisture as the polymer returns to its natural state; a protective cover (130) protecting the box and its contents from heat radiation (*e.g.*, sunlight).